

XXII. *Considerations on the Genus Tetracanthagyna Selys.*
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WHEN Mr. C. O. Waterhouse in 1877 and 1878 described in our "Proceedings" and "Transactions" a grand dragon-fly, under the name *Gynacantha plagiata*, he acted, I believe, on my suggestion as to its generic position. In 1883 my friend Baron de Selys, in his "Synopsis des *Æschnines*" (part i, classification), subdivided *Gynacantha*, Rambur, and proposed the subgeneric term *Tetracanthagyna* for *G. plagiata*, being influenced principally by the conformation of the 10th ventral segment in the female. Prof. Karsch, in 1891, in his "Kritik des Systems der *Aeschniden*" (in which he propounded a new scheme which, I venture to think, is a distinct step in advance), refused to recognise *Tetracanthagyna* even as a subgenus.

Having to examine the materials available for a study of the genus, of which there are certainly several species, I arrived at the conclusion that not only is *Tetracanthagyna* valid, but also that its relationship to *Gynacantha* is perhaps not so intimate as has been thought; the membranule is more developed, the network less dense, and the abdomen more robust with, if I mistake not, a less strongly chitinous integument. A character which may, or may not, prove to be of importance, is the sinuate contour of the ventral surface, caused by constrictions; nor should the very short styliform appendages of the female be overlooked. Even from the limited materials at present available, there are indications that the teeth on the 10th ventral segment of the female will prove to be somewhat variable, but probably individually rather than specifically.

I propose to describe in detail what appears to be a new species, then to give in a tabular form characters of the described, and some new, species, ending by noticing some specimens the position of which seems uncertain.

TETRACANTHAGYNA VITTATA, sp. n.

♂ ♀. Face dingy olive yellow, labium shining blackish-brown, tips of mandibles black; frons (excepting a line at the base) and vertex wholly blackish, the vertex with a strong anterior ridge, and a broad deep longitudinal groove, it is clothed with erect blackish hairs; vesicle black; antennae reddish, black at the base; occiput black; back of head blackish, but with an olivaceous orbital margin. Prothorax blackish, its hinder margin produced into a broad median obtuse lobe, and slightly excised on either side. Thorax brownish-black, clothed with greyish-brown hairs, the ante-alar sinus olive-brown; anteriorly there are indications (at any rate in the ♀) of short narrow ante-humeral pale lines; sides with two very broad greyish-yellow bands, one mesopleural, the other metapleural, separated by a still broader mesopleural band of the dark ground colour; pectus blackish; legs with dark reddish femora (black at the tips) and black tibiae and tarsi, spines black, claws piceous. Abdomen robust, apparently wholly blackish, with no indications of markings in the dead insect (but in the somewhat immature ♂ there is an indistinct olivaceous tinge).

Wings comparatively narrow, the apex obtuse but somewhat produced; vitreous, but the anterior portion is occupied by a brownish-black vitta from the base to the pterostigma; at the base this vitta is broad and its lower edge extends into the lower basal area, then it is limited by the upper edge of the principal triangle, then it occupies (partly in a fainter manner) the area between the subnodal and short sectors for some distance, then it is limited by the subnodal sector, then slightly invading the area between the nodal and subnodal sectors and then bounded by the principal sector as far as the pterostigma or slightly beyond; in this vitta many of the areoles below the median nervure have a pale centre (but in a somewhat irregular manner), and most of the marginal nervules (at the base almost as far as the triangle) are pale, and in addition (especially in the costal area as far as the pterostigma) are also narrowly margined with pale; costal nervure olivaceous (almost whitish in the somewhat immature ♂), much incrassated towards the base; neuriation otherwise black, not very dense for the size of the insect; pterostigma very small (4 mm.), brown (almost white in the somewhat immature ♂); membranule whitish, well-defined; subnodal sector furcating far before the origin of the pterostigma; in the anterior wings there are about 34 ante-nodal and 23 post-nodal nervules, 8—10 hyper-trigonal, 7 in the lower basal area, 1 in the inner triangle, 7 cellules in the principal triangle (the two inner divided by a longitudinal nervule in the ♀, and

symmetrically irregular in the ♂ individual before me, although regular in the posterior wings); nodal sector much bent just before the pterostigma (somewhat as in [the genus *Hemianax*], with several double cellules below the bend; 4—5 rows of cellules between the subnodal sector and its branch; 5 cellules between the subnodal and the interposed sector at the widest part; a single row of cellules between the sectors of the triangle. (In the posterior wings the area between the sectors of the triangle is dilated for some distance, with two rows of cellules, followed by one row.)

♂. Anal triangle 3-celled; the inner upper cellule formed by an oblique nervule (in one wing there is a small supplementary cellule on the inner margin). On the abdomen the oreillettes are subquadrate, black, finely limate on the edge. The 8th dorsal segment is produced into a small acute tooth in the middle of its posterior margin, on either side of which are smaller teeth; the 9th has a stronger and blunter tooth-like production, and in the 10th there is a terminal hump, in all cases extensions of the dorsal carina, which on the 10th is much elevated, and has a deep broad sulcus on either side. Appendages black; the superior about as long as the 9th and 10th segments united (8 mm.), inserted well below the elevated hump of the segment, foliaceous, but slender, nearly straight, but slightly curved upwards from the middle; viewed above the inner edge is gradually dilated from base and apex to the middle, the tip ending in a sharp out-turned tooth or spine; the apical portion for some distance is occupied internally by a deep groove bounded by the longitudinal carina and occasioning a torsion which causes an appearance as of an obtuse subapical dilatation if viewed laterally; the apical half internally has a strong fringe of hairs. Inferior appendage one-third shorter, upcurved if viewed laterally, slender, gradually narrowing from the base, it is sulcated above, and the apex is obtuse and slightly emarginate.

♀. The 8th and 9th dorsal segments strongly produced into a triangular tooth in the middle of the posterior margin, 10th scarcely produced, but there are a few apical denticules. Appendages short, black, straight, styliform and cylindrical, scarcely extending beyond the abdominal extremity. Tenth ventral segment having (in the individual before me) three large and one small acute teeth. Valves of the 9th segment not extending to apex of 10th, with black filiform appendages.

Length of abdomen ♂ 80 mm. (with appendages), ♀ 70 mm. Length of posterior wing ♂ 75 mm., ♀ 80 mm. Greatest breadth of posterior wing ♂ 23 mm., ♀ 22 mm. Expanse of anterior wings ♂ 159 mm., ♀ 169 mm.

Hab. NORTH BORNEO (*Waterstradt*) one ♂ and ♀ (the ♂ slightly immature). *Coll. McLachlan.*

Distinctly related to *T. plagiata*, but can scarcely be identical therewith. Taking size and strength combined this and *T. plagiata* may be considered the largest of known recent Odonata, for although some Agrionines (such as *Megaloprepus cœnulatus*) somewhat exceed them in wing-expanse, they are feeble animals in comparison.

I proceed to give a synoptical table.

A. Legs black; the femora dark reddish, except at the apex. Sides of the thorax with two broad pale bands. Eighth and ninth dorsal segments of the abdomen in the ♀ ending in a tooth. Neuration black. The area between the two sectors of the triangle in the anterior wings not dilated at the base, and with only a single row of cellules (one cellule is indicated as double in each anterior wing in the figure of *T. plagiata*). A blackish vitta (broad at the base) extends from the base to the pterostigma (or further).

1. In addition to the costal vitta there is a broad dark band on all the wings of the ♀ between the nodus and the pterostigma (or further). Length of posterior wing 79 mm. Length of abdomen 69 mm. *T. PLAGIATA*, Waterhouse

Hab. BORNEO. Type in the collection of Sir Hugh Low, not seen by me recently.

2. There is no band in addition to the costal vitta in either sex. Anterior wings with about 34 antenodals and 23 postnodals. Length of posterior wing ♂ 75 mm., ♀ 80 mm. Length of abdomen ♀ 70 mm. . . . *T. VITTATA*, McLachl. (*vide supra*),

Hab. NORTH BORNEO. Types in Coll. McLachlan.

B. Legs wholly reddish. Ninth dorsal segment only, of the ♀ ending in a sharp tooth.

1. Sides of the thorax reddish with no evident pale bands. Neuration reddish. In the wings there is a brown costal vitta extending from the base to the pterostigma (or nearly so). The area between the two sectors of the triangle in the anterior wings not dilated at the base, and with only a single row of cellules (this area is not mentioned in the description of *T. degorsi*).

- a. In addition to the costal vitta there is a broad brown band (in the ♀ only?) between the nodus and pterostigma. Anterior wings with about 36-38 antenodals and 24-25 postnodals. Length of posterior wing 65-68 mm. Length of abdomen 59-60 mm. *T. BRUNNEA*, sp. nov.

Hab. NORTH BORNEO. Two ♀ in Coll. McLachlan.

- aa. No brown band between the nodus and pterostigma in either sex. Anterior wings with 38 antenodals and 25 postnodals. Length of posterior wing ♂ 56 mm., ♀ 65 mm. Length of abdomen ♀ 65 mm. *T. DEGORSI*, Martin. (Bull. Soc. Ent. Fr., 1895, p. cccxciii.)

Hab. BORNEO. ♂ ♀ Coll. Martin, not seen by me. It is just possible that *T. brunnea* may be founded on more mature individuals of *degorsi*; but more material is necessary.

2. Sides of the thorax with two broad pale bands. Neuration black. In the wings (♀) there is no dark costal vitta, but a dark brown mark at the base extending a short distance along the subcostal area; no brown band, but the apical portion of the wing is slightly tinged. Anterior wings with about 28 antenodals and 18 postnodals. The area between the two sectors of the triangle in the anterior wings dilated at the base and with two rows of cellules, followed by one. Length of posterior wing 61 mm. Length of abdomen 58 mm. *T. WATERHOUSEI* (Selys MS.) sp. n.

Hab. BORNEO, one ♀ in the British Museum bearing the MS. name here adopted; one ♀ in coll. McLachlan, without locality.

This would seem to be a very distinct species by the restriction of the wing markings, notwithstanding that the deep black neuration indicates maturity. The neuration is also less dense, and it is the only species at present known with the area between the sectors of the triangle in the *anterior* wings dilated at the base and with two rows of cellules.

It remains to allude to certain specimens that I cannot locate with certainty.

In a male from Pulo Nias (Coll. McLachlan) the legs are

wholly reddish, there are no pale bands on the sides of the thorax, a smoky blackish costal vitta extends from the base to the nodus (or slightly beyond), no dark bands on the wings, pterostigma whitish, neuration black, the area between the two sectors of the triangle not dilated and with only one row of cellules. About 36 antenodals and 23 postnodals in the anterior wing. Length of posterior wing 60 mm. Length of abdomen (with appendages) 63 mm.

The anal characters are as follows:—There is a slight tooth at the extremity of the dorsal carina on the 9th segment, but the 10th is not sensibly produced at its extremity. There is a strong constriction at the junction of the 6th and 7th ventral segments, reproduced in a smaller degree at the junction of the 7th and 8th (this seems to some extent to exist in the other species). Superior appendages slightly shorter than the 9th and 10th segments, slender, foliaceous, (less twisted than in *T. vittata*), ending in a small sharp tooth. Inferior appendage one-half shorter, narrowing from base to apex, upcurved, the apex obtuse and slightly emarginate.

A male from Deli (Sumatra) is described by Prof. Karsch in Entomol. Nachr. xvii. (1891), p. 345, and referred to *T. plagiata*. The wing-expanse is given as 135 mm., and the length of the abdomen as 90 mm. (thus the expanse is much less, and the abdomen considerably longer than in my ♂ of *T. vittata*); there is apparently no dark band on the wings. Nothing is said of the colour of the legs, or sides of the thorax, nor of the condition of the area between the sectors of the triangle. It is evidently very much larger than my male from Pulo Nias.

A female example from Laha (Sumatra), in the Amsterdam Museum, is referred to *T. plagiata* by Baron de Selys (Ann. Mus. Civ. Genov. (2), vii., p. 472). The length of the posterior wing is given as 74 mm., and of the abdomen 58 mm. Presumably it has a costal vitta and transverse band, but no details are to hand.